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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,671	10/12/2001	Toshiyuki Miyabashi	U 013667-3	1087

7590 09/30/2004  
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EXAMINER

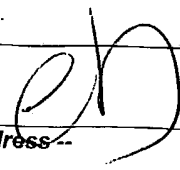
SHOSHO, CALLIE E

ART UNIT PAPER NUMBER

1714

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/976,671	MIYABASHI ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 8-20 and 22-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-20 and 22-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. All outstanding rejections are overcome by applicants' amendment filed 7/19/04.

The new grounds of rejection as set forth below are necessitated by applicants' amendment and thus, the following action is final.

**Claim Rejections - 35 USC § 112**

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of claim 22, which depends on claim 21, is confusing given that claim 21 has been cancelled. Should the dependency of claim 22 be changed to claim 1?

**Claim Rejections - 35 USC § 103**

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 8-9, 15-17, 19-20, 22-31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman et al. (U.S. 2002/0065347) in view of Ohta et al. (U.S. 5,954,866).

Freeman et al. disclose ink jet ink comprising water, solvent, 3-8% pigment including self-dispersible pigment, 1-30% humectant such as glycerol, penetrant such as 1,2-hexanediol, and 0.1-10% film-forming binder which is a polymer emulsion produced by process which comprises the steps of mixing water, monomer, emulsifier, and initiator together to allow emulsion polymerization to proceed to form polymer emulsion followed by adjusting the pH to alkaline, for instance, 8.5, using potassium hydroxide. There is also disclosed a method wherein the ink is printed using ink jet printer onto substrate (paragraphs 16-17, 19-21, 26, 28-30, 32-33, and 61-62).

Although there is no explicit disclosure of the reactivity of the polymer with divalent metal salt as required in present claim 33, it is understood (see page 10, line 19-page 11, line 7 of the present specification) that the reactivity is determined by both the fine polymer particle diameter and the amount of carboxyl groups on the surface of the particle. It is noted that Freeman et al. disclose polymer emulsions that naturally contain high amounts of carboxyl groups on the surface, i.e. obtained from acid component, and have a diameter of 250-400 nm. Since Freeman et al. clearly meets both criteria for reactivity as disclosed above, it is expected that the reference fine polymer particle will intrinsically exhibit reactivity similar to that claimed.

The difference between Freeman et al. and the present claimed invention is the requirement in the claims of (a) solid wetting agent and (b) pH adjustor.

With respect to difference (a), Ohta et al., which is drawn to ink jet ink, disclose the use of 0.1-40% saccharide in order to impart good moisture retention to the ink and produce ink with suitable viscosity so that the ink can be ejected effectively from the printer (col.8, lines 3-27).

In light of the motivation for using saccharide disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use saccharide in the ink jet ink of Freeman et al. in order to produce ink with good moisture retention and suitable viscosity, and thereby arrive at the claimed invention.

With respect to difference (b), Ohta et al., which is drawn to ink jet ink, disclose the use of pH adjustor such as sodium hydroxide, lithium hydroxide, or potassium hydroxide in order to improve the dispersion stability of the pigment and resin emulsion (col.9, lines 26-31).

In light of the motivation for using pH adjustor disclosed by Ohta et al. as describe above, it therefore would have been obvious to one of ordinary skill in the art to use such pH adjustor in the ink jet ink of Freeman et al. in order to produce ink with good stability, and thereby arrive at the claimed invention.

6. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman et al. in view of Ohta et al. as applied to claims 8-9, 15-17, 19-20, 22-31, and 33-35 above, and further in view of either Belmont et al. (U.S. 5,630,868) or Suzuki et al. (U.S. 6,153,001).

The difference between Freeman et al. in view of Ohta et al. and the present claimed invention is the requirement in the claims of specific type of pigment.

Belmont et al. disclose the use of modified carbon black containing hydrophilic group on its surface wherein the hydrophilic group includes sulfonic acid, sulfinic acid, carboxylic acid and their salts. The motivation for using such pigment is that it has improved water dispersability as compared to untreated carbon black and produces ink with good stability, jettability, print

quality, and optical density (col.4, lines 15-21, 29-35, and 44-46, col.5, lines 46-47, col.5, line 63-col.6, line 6, and col.6, lines 41-56).

Alternatively, Suzuki et al. disclose self-dispersing pigment containing hydrophilic group on its surface wherein the hydrophilic group includes sulfonic acid and carboxylic acid and their salts. The motivation for using such pigment is that no dispersant is required to stably disperse the pigment in the ink (col.7, lines 5-62).

In light of the motivation for using specific type of pigment disclosed by either Belmont et al. or Suzuki et al., it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Freeman et al. in order to produce ink which has good stability, jettability, print quality, and optical density, or alternatively, to produce ink which does not require dispersant, and thereby arrive at the claimed invention.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman et al. in view of Ohta et al. as applied to claims 8-9, 15-17, 19-20, 22-31, and 33-35 above, and further in view of Kubota et al. (U.S. 6,039,796).

The difference between Freeman et al. in view of Ohta et al. and the present claimed invention is the requirement in the claim of specific type of penetrant.

Kubota et al., which is drawn to ink jet ink, disclose the use of glycol ether penetrant (col.5, line 66-col.6, line 7) in order to increase penetration of ink into substrate.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use glycol ether penetrant in the ink jet ink of Freeman et al., and thereby arrive at the claimed invention.

8. Claims 8-9, 15, 19-20, and 22-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganapathiappan et al. (U.S. 2003/0060562) in view of Ohta et al. (U.S. 5,954,866).

Ganapathiappan discloses ink jet ink comprising water, solvent in amount of, for instance, 10%, 0.1-15% pigment, penetrant, wetting agent, and 1-5% polymer emulsion comprising fine particles of polymer wherein the polymer emulsion is produced by process which comprises the steps of mixing water, monomer, emulsifier, and initiator together to allow emulsion polymerization to proceed to form polymer emulsion followed by adjusting the pH greater than 7 using potassium hydroxide. It is disclosed that the polymer is produced from monomers including 0.1-5% crosslinking monomer and 1-60% hydrophilic monomers comprising acidic functional groups. There is also disclosed a method wherein the ink is printed using ink jet printer onto substrate (paragraphs 10, 14, 23-24, 33, 62-63, 65, 78, 81, 87, and 89).

Although there is no explicit disclosure of the reactivity of the polymer with divalent metal salt as required in present claim 33, it is understood (see page 10, line 19-page 11, line 7 of the present specification) that the reactivity is determined by both the fine polymer particle diameter and the amount of carboxyl groups on the surface of the particle. It is noted that Ganapathiappan discloses polymer emulsions that naturally contain high amounts of carboxyl groups on the surface, i.e. obtained from hydrophilic monomers comprising acidic functional groups, and have average diameter of 5-500 nm. Since Ganapathiappan clearly meets both criteria for reactivity as disclosed above, it is expected that the reference fine polymer particle will intrinsically exhibit reactivity similar to that claimed.

The difference between Ganapathiappan and the present claimed invention is the requirement in the claims of (a) solid wetting agent, (b) pH adjustor, and (c) specific type of wetting agent.

With respect to difference (a), Ohta et al., which is drawn to ink jet ink, disclose the use of 0.1-40% saccharide in order to impart good moisture retention to the ink and produce ink with suitable viscosity so that the ink can be ejected effectively from the printer (col.8, lines 3-27).

In light of the motivation for using saccharide disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use saccharide in the ink jet ink of Ganapathiappan in order to produce ink with good moisture retention and suitable viscosity, and thereby arrive at the claimed invention.

With respect to difference (b), Ohta et al., which is drawn to ink jet ink, disclose the use of pH adjustor such as sodium hydroxide, lithium hydroxide, or potassium hydroxide in order to improve the dispersion stability of the pigment and resin emulsion (col.9, lines 26-31).

In light of the motivation for using pH adjustor disclosed by Ohta et al. as describe above, it therefore would have been obvious to one of ordinary skill in the art to use such pH adjustor in the ink jet ink of Ganapathiappan in order to produce ink with good stability, and thereby arrive at the claimed invention.

With respect to difference (c), Ohta et al., which is drawn to ink jet inks, disclose the use of glycerol in order to prevent clogging of the printer nozzles and improve the moisture retention and storage stability of the ink (col.8, lines 36-39 and 44).

In light of the motivation for using glycerol disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use glycerol in the ink of



Ganapathiappan in order to produce ink with good storage stability and moisture retention that will not clog the printer nozzles, and thereby arrive at the claimed invention.

9. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganapathiappan in view of Ohta et al. as applied to claims 8-9, 15, 19-20, and 22-35 above, and further in view of either Belmont et al. (U.S. 5,630,868) or Suzuki et al. (U.S. 6,153,001).

The difference between Ganapathiappan in view of Ohta et al. and the present claimed invention is the requirement in the claims of specific type of pigment.

Belmont et al. disclose the use of modified carbon black containing hydrophilic group on its surface wherein the hydrophilic group includes sulfonic acid, sulfinic acid, carboxylic acid and their salts. The motivation for using such pigment is that it has improved water dispersability as compared to untreated carbon black and produces ink with good stability, jettability, print quality, and optical density (col.4, lines 15-21, 29-35, and 44-46, col.5, lines 46-47, col.5, line 63-col.6, line 6, and col.6, lines 41-56).

Alternatively, Suzuki et al. disclose self-dispersing pigment containing hydrophilic group on its surface wherein the hydrophilic group includes sulfonic acid and carboxylic acid and their salts. The motivation for using such pigment is that no dispersant is required to stably disperse the pigment in the ink (col.7, lines 5-62).

In light of the motivation for using specific type of pigment disclosed by either Belmont et al. or Suzuki et al., it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Ganapathiappan in order to produce ink which has good stability,

jettability, print quality, and optical density, or alternatively, to produce ink which does not require dispersant, and thereby arrive at the claimed invention.

10. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganapathiappan in view of Ohta et al. as applied to claims 8-9, 15, 19-20, and 22-35 above, and further in view of Kubota et al. (U.S. 6,039,796).

The difference between Ganapathiappan in view of Ohta et al. and the present claimed invention is the requirement in the claims of specific type of penetrant.

Kubota et al., which is drawn to ink jet ink, disclose the use of glycol ether penetrant (col.5, line 66-col.6, line 7) in order to increase penetration of ink into substrate.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use glycol ether penetrant in the ink jet ink of Ganapathiappan, and thereby arrive at the claimed invention.

11. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganapathiappan in view of Ohta et al. as applied to claims 8-9, 15, 19-20, and 22-35 above, and further in view of McCain et al. (U.S. 5,981,623).

The difference between Ganapathiappan in view of Ohta et al. and the present claimed invention is the requirement in the claims of specific type of penetrant.

McCain et al., which is drawn to ink jet ink, disclose the use of 1,2-hexanediol or 1,2-pentanediol in order to improve penetration of the ink into the substrate and eliminate intercolor bleed (col.4, lines 56-67).

In light of the motivation for using specific penetrant disclosed by McCain et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such penetrant in the ink jet ink of Ganapathiappan in order to produce ink which effectively penetrants into paper and does not exhibit intercolor bleed, and thereby arrive at the claimed invention.

### **Response to Arguments**

12. Applicants argue that either Freeman et al. or Ganapathiappan in combination with Ohta et al. are not relevant references against the present claims in light of the comparative data set forth in the present specification.

As set forth in Table B1, the specification compares inks within the scope of the present claims, i.e. comprising solid wetting agent (example B1), with inks outside the scope of the present claims, i.e. comprising no wetting agent (examples B7 and B8). It is shown in Table B2 that the inventive inks are superior in terms of anti-clogging property and storage stability.

However, it is the examiner's position that the data is not successful in establishing unexpected or surprising results over the cited prior art given that Ohta et al. already recognizes the criticality of using solid wetting agent such as saccharide. Col.8, lines 24-27 of Ohta et al. disclose that the saccharide is used in order to impart good moisture retention to the ink and produce ink with suitable viscosity so that the ink can be ejected effectively from the printer. Further, attention is drawn to Table 1 of Ohta et al. (col.18) wherein inks with saccharide (examples 1-12 and comparative example 2) are compared to inks without saccharide (comparative example 1). It is shown that the ink without saccharide is inferior in terms of

nozzle clogging and ejection stability. It is noted that nozzle clogging is the same motivation for using saccharide as disclosed in the present invention.

In light of the above, it is clear that Ohta et al. already discloses the criticality of using saccharide.

Applicants further argue that there is no motivation to combine Freeman et al. or Ganapathiappan with Ohta et al. given that each of these references already disclose the use of humectant to impart moisture retention and thus, there would be no motivation to also use saccharide of Ohta et al. However, attention is drawn to the examples of Ohta et al. that utilize both saccharide and humectant. Thus, it is clear that one of ordinary skill in the art would use ink that contains combination of such ingredients.

Applicants further argue that Freeman et al. and Ganapathiappan were filed after the publication of the Ohta et al. reference and would have taught the inclusion of solid wetting agent is advantageous effects could have been expected. However, the absence in Freeman et al. or Ganapathiappan of solid wetting agent does not negate the fact that it would have been obvious for one of ordinary skill in the art to add such solid wetting in order to improve the properties of the ink. Given that the Freeman et al., Ganapathiappan, and Ohta et al. are all drawn to the same field of endeavor, given that there is proper motivation to combine Ohta et al. with Freeman et al. or Ganapathiappan, and given that Ohta et al. already discloses the criticality of using saccharide, it is the examiner's position that the combination of Freeman et al. or Ganapathiappan with Ohta et al. is proper.

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13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho  
Primary Examiner  
Art Unit 1714

CS  
9/28/04